



282605

## MEMORANDUM

**DATE:** November 7, 2005  
**TO:** Bureau File  
**FROM:** Bob Casper  
**SUBJECT:** Sample Quantitation Limit and Adjusted Value Calculations  
**SITE NUMBER:** L1358070001 - Montgomery  
Eagle Zinc Company  
ILD 980606941  
SF/HRS

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**Sample Quantitation Limit Calculation**

A primary component of evaluating the impact of a site on its surroundings is to determine if the hazardous substances associated with the site have been released to the environment, specifically to surrounding media such as groundwater, surface water, soil, or air. The Hazard Ranking System (HRS) Rule (40 CFR Part 300) identifies the release of hazardous substances to the environment through the establishment of an "observed release" or in the case of soil exposure, "observed contamination". The HRS Rule identifies an observed release through comparison of contaminant concentrations in a release sample to those concentrations in a sample considered to be representative of background (Ref. 1, p. 51589). However, before the release sample concentrations can be compared to background, HRS requires that the contaminants be present at concentrations above the sample quantitation limit (SQL) (Ref. 1, p. 51589). The HRS defines the SQL as "Quantity of a substance that can reasonably quantified given the limits of detection for the methods of analysis and sample characteristics that may affect quantitation" (Ref. 1, p. 51586). Therefore, the SQL must be identified for each sample and background sample to be used for HRS purposes.

Laboratory data packages provided to Illinois EPA and the United States Environmental Protection Agency (USEPA) through the contract laboratory program do not always provide the SQL for each sample and therefore, it must be calculated. The procedures used to calculate the SQL for each sample used in the HRS Documentation Record are explained within this memorandum.

The formula below was used to calculate the SQL for each sample included in the Documentation Record:

$$\text{Sample Quantitation Limit (mg/kg)} = \frac{C \times V}{W \times S}$$

where,

C = Method Detection Limit (ug/L)

V = Final volume in liters after sample preparation

W = Weight in grams of wet sample

S = % Solids/100

Tables 1 -- 4 are attached to this memorandum and provide the required information to calculate SQLs for pertinent samples and constituents for each source and background sample identified in the Eagle Zinc Company HRS Documentation Record.

I *Bob Casper, IEPA*

## **Adjusted Value Calculation**

In certain cases data provided to Illinois EPA by laboratories analyzing samples from the Eagle Zinc Company site were qualified. The USEPA developed a fact sheet in 1996 entitled "Using Qualified Data to Document an Observed Release and Observed Contamination" to help site assessors determine the usability of qualified date for site assessment and HRS scoring purposes (Ref. 2, p.1). The fact sheet explains different types of laboratory data qualifiers and explains situations when it is acceptable/appropriate to use qualified data. In certain cases, the fact sheet provides "adjustment factors" for qualified data (Ref. 2, p. 4). In accordance with the USEPA fact sheet, adjustment factors were applied to Eagle Zinc Company data for release samples that were estimated ("J" qualified). Samples that had an unknown bias ("J") had a factor applied and samples with a low bias (J-) were used as is without the application of a factor (Ref 2, p 4).

### Background Sample

Adjustment factors were applied to background data. The "J" values for arsenic, cobalt, mercury and selenium were not biased "low" or "high" on the data and are considered to have an unknown bias (Ref. 3, p. 158, 160). In accordance with USEPA fact sheet "Using Qualified Data to Document an Observed Release and Observed Contamination", the "J" concentrations were multiplied by: 1.2 (cobalt), 1.7 (mercury), 2.3 (selenium) and 1.4 (cyanide) (Ref. 2, p 13).

### Source 1 – Deep Slag Pile

Data for some cyanide, mercury and selenium samples were qualified as estimated ("J") and are considered to have an unknown bias. Review of the laboratory narrative indicated that the reported concentrations for one cyanide sample and all selenium samples were biased low (J-) (Ref. 3, p. 95, 98). In accordance with USEPA fact sheet "Using Qualified Data to Document an Observed Release and Observed Contamination", the estimated concentrations for (J) cyanide were divided by an adjustment factor of 1.4 and estimated values of (J) mercury were dived by an adjustment factor of 1.7 (Ref 2, p13). No adjustment factors were applied for low biased (J-) cyanide and selenium samples (Ref. 2, p.4).

### Source 2 – Shallow Slag Pile

Data for some mercury, cyanide and selenium samples were qualified as estimated. Review of the laboratory narrative indicated that the reported concentrations for mercury and some cyanide had an unknown bias whereas selenium and one cyanide samples were biased low (Ref. 3, p. 95, 98). In accordance with USEPA fact sheet "Using Qualified Data to Document an Observed Release and Observed Contamination", the estimated concentrations for unknown biased cyanide were divided by 1.41 and mercury by 1.7 (Ref. 2, p 13). No adjustment factors were applied to low biased samples (Ref. 2, p. 4).

### Source 3 – Contaminated Sediment

Data for arsenic, cobalt, mercury, selenium, and cyanide in some samples were qualified as estimated and review of the laboratory narrative indicated the bias on the samples was (J) unknown (Ref. 3, p. 101, 102,158, 159, ). In accordance with USEPA fact sheet "Using Qualified Data to Document an Observed Release and Observed Contamination", the estimated concentrations for arsenic cobalt, mercury, selenium, and cyanide were divided by an adjustment factors of 1.6, 1.2, 1.7, 2.3 and 1.4, respectively because of an "unknown bias" (Ref. 2, p. 13). Some selenium samples were biased low (J-) (Ref 8, p 98) and no adjustment factor was applied (Ref 2, p 4).

## **REFERENCES**

1. United States Environmental Protection Agency (USEPA). Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51533. December 14, 1990. 136 pages.
2. United States Environmental Protection Agency. Using Qualified Data to Document an Observed Release and Observed Contamination. Publication 9285.7-14FS, EPA 540-F-94-028, PB94-963311. November 1996. 18 pages.
3. Illinois Environmental Protection Agency (Illinois EPA). CERCLA Expanded Site Inspection Addendum Report – Eagle Zinc Company, ILD 980606941. September 2005. 375 pages.

**Table 1**  
**Sample Quantitation Limit Calculations for Source 1**

Sample Location	Sample No.	Compound	MDL (ug/L)	MDL (mg/kg)	Percent Solids	Weight of Sample in grams	Volume in mL	Wm	Vm	SQL
X301	ME00L0	Arsenic	35	0.350	88.3	1.01	100	1	100	0.392
X301	ME00L0	Barium	15	0.150	88.3	1.01	100	1	100	0.168
X301	ME00L0	Cadmium	15	0.150	88.3	1.01	100	1	100	0.168
X301	ME00L0	Chromium	18	0.180	88.3	1.01	100	1	100	0.202
X301	ME00L0	Copper	53	0.530	88.3	1.01	100	1	100	0.594
X301	ME00L0	Lead	28	0.280	88.3	1.01	100	1	100	0.314
X301	ME00L0	Manganese	12	0.120	88.3	1.01	100	1	100	0.135
X301	ME00L0	Mercury	4.4	0.044	88.3	1.01	100	1	100	0.049
X301	ME00L0	Nickel	28	0.280	88.3	1.01	100	1	100	0.314
X301	ME00L0	Selenium	90	0.900	88.3	1.01	100	1	100	1.009
X301	ME00L0	Silver	32	0.320	88.3	1.01	100	1	100	0.359
X301	ME00L0	Zinc	30	0.300	88.3	1.01	100	1	100	0.336
X301	ME00L0	Cyanide	2	0.020	88.3	1.01	100	1	100	0.022
X302	ME00L1	Arsenic	35	0.350	93.9	1.02	100	1	100	0.365
X302	ME00L1	Barium	15	0.150	93.9	1.02	100	1	100	0.157
X302	ME00L1	Cadmium	15	0.150	93.9	1.02	100	1	100	0.157
X302	ME00L1	Chromium	18	0.180	93.9	1.02	100	1	100	0.188
X302	ME00L1	Copper	53	0.530	93.9	1.02	100	1	100	0.553
X302	ME00L1	Lead	28	0.280	93.9	1.02	100	1	100	0.292
X302	ME00L1	Manganese	12	0.120	93.9	1.02	100	1	100	0.125
X302	ME00L1	Mercury	4.4	0.044	93.9	1.02	100	1	100	0.046
X302	ME00L1	Nickel	28	0.280	93.9	1.02	100	1	100	0.292
X302	ME00L1	Selenium	90	0.900	93.9	1.02	100	1	100	0.940
X302	ME00L1	Silver	32	0.320	93.9	1.02	100	1	100	0.334
X302	ME00L1	Zinc	30	0.300	93.9	1.02	100	1	100	0.313
X302	ME00L1	Cyanide	2	0.020	93.9	1.02	100	1	100	0.021
X303	ME00L2	Arsenic	35	0.350	88	1	100	1	100	0.398
X303	ME00L2	Barium	15	0.150	88	1	100	1	100	0.170
X303	ME00L2	Cadmium	15	0.150	88	1	100	1	100	0.170
X303	ME00L2	Chromium	18	0.180	88	1	100	1	100	0.205
X303	ME00L2	Copper	53	0.530	88	1	100	1	100	0.602
X303	ME00L2	Lead	28	0.280	88	1	100	1	100	0.318
X303	ME00L2	Manganese	12	0.120	88	1	100	1	100	0.136
X303	ME00L2	Mercury	4.4	0.044	88	1	100	1	100	0.050
X303	ME00L2	Nickel	28	0.280	88	1	100	1	100	0.318
X303	ME00L2	Selenium	90	0.900	88	1	100	1	100	1.023
X303	ME00L2	Silver	32	0.320	88	1	100	1	100	0.364
X303	ME00L2	Zinc	30	0.300	88	1	100	1	100	0.341
X303	ME00L2	Cyanide	2	0.020	88	1	100	1	100	0.023
X304	ME00L3	Arsenic	35	0.350	89.5	1	100	1	100	0.391
X304	ME00L3	Barium	15	0.150	89.5	1	100	1	100	0.168
X304	ME00L3	Cadmium	15	0.150	89.5	1	100	1	100	0.168
X304	ME00L3	Chromium	18	0.180	89.5	1	100	1	100	0.201
X304	ME00L3	Copper	53	0.530	89.5	1	100	1	100	0.592
X304	ME00L3	Lead	28	0.280	89.5	1	100	1	100	0.313
X304	ME00L3	Manganese	12	0.120	89.5	1	100	1	100	0.134
X304	ME00L3	Mercury	4.4	0.044	89.5	1	100	1	100	0.049
X304	ME00L3	Nickel	28	0.280	89.5	1	100	1	100	0.313
X304	ME00L3	Selenium	90	0.900	89.5	1	100	1	100	1.006
X304	ME00L3	Silver	32	0.320	89.5	1	100	1	100	0.358
X304	ME00L3	Zinc	30	0.300	89.5	1	100	1	100	0.335
X304	ME00L3	Cyanide	2	0.020	89.5	1	100	1	100	0.022
X305	ME00L4	Arsenic	35	0.350	92.2	1	100	1	100	0.380
X305	ME00L4	Barium	15	0.150	92.2	1	100	1	100	0.163
X305	ME00L4	Cadmium	15	0.150	92.2	1	100	1	100	0.163
X305	ME00L4	Chromium	18	0.180	92.2	1	100	1	100	0.195
X305	ME00L4	Copper	53	0.530	92.2	1	100	1	100	0.575
X305	ME00L4	Lead	28	0.280	92.2	1	100	1	100	0.304
X305	ME00L4	Manganese	12	0.120	92.2	1	100	1	100	0.130
X305	ME00L4	Mercury	4.4	0.044	92.2	1	100	1	100	0.048
X305	ME00L4	Nickel	28	0.280	92.2	1	100	1	100	0.304
X305	ME00L4	Selenium	90	0.900	92.2	1	100	1	100	0.976
X305	ME00L4	Silver	32	0.320	92.2	1	100	1	100	0.347
X305	ME00L4	Zinc	30	0.300	92.2	1	100	1	100	0.325
X305	ME00L4	Cyanide	2	0.020	92.2	1	100	1	100	0.022

Notes:

MDL - Method Detection Limit

mL - volume of final volume in milliliters after sample preparation

SQL - Sample Quantitation Limit

Wm - Minimum method required wet sample weight

Vm - Method required final sample volume

**Table 1 (cont.)**  
**Sample Quantitation Limit Calculations for Source 1**

Notes:

MDL - Method Detection Limit

mL = volume of final volume in milliliters after sample preparation

SQI - Sample Quantitation Limit

W<sub>m</sub> - Minimum method required wet sample weight

V<sub>m</sub> - Method required final sample volume

**Table 2**  
**Sample Quantitation Limit Calculations for Source 2**

Sample Location	Sample No.	Compound	MDL (ug/L)	MDL (mg/kg)	Percent Solids	Weight of Sample in grams	Volume in mL	Wm	Vm	SQL
X307	ME00L6	Arsenic	35	0.350	86.4	1.01	100	1	100	0.401
X307	ME00L6	Barium	15	0.150	86.4	1.01	100	1	100	0.172
X307	ME00L6	Cadmium	15	0.150	86.4	1.01	100	1	100	0.172
X307	ME00L6	Chromium	18	0.180	86.4	1.01	100	1	100	0.206
X307	ME00L6	Copper	53	0.530	86.4	1.01	100	1	100	0.607
X307	ME00L6	Lead	28	0.280	86.4	1.01	100	1	100	0.321
X307	ME00L6	Manganese	12	0.120	86.4	1.01	100	1	100	0.138
X307	ME00L6	Mercury	4.4	0.044	86.4	1.01	100	1	100	0.050
X307	ME00L6	Nickel	28	0.280	86.4	1.01	100	1	100	0.321
X307	ME00L6	Selenium	90	0.900	86.4	1.01	100	1	100	1.031
X307	ME00L6	Silver	32	0.320	86.4	1.01	100	1	100	0.367
X307	ME00L6	Zinc	30	0.300	86.4	1.01	100	1	100	0.344
X307	ME00L6	Cyanide	2	0.020	86.4	1.01	100	1	100	0.023
X308	ME00L7	Arsenic	35	0.350	95.5	1.02	100	1	100	0.359
X308	ME00L7	Barium	15	0.150	95.5	1.02	100	1	100	0.154
X308	ME00L7	Cadmium	15	0.150	95.5	1.02	100	1	100	0.154
X308	ME00L7	Chromium	18	0.180	95.5	1.02	100	1	100	0.185
X308	ME00L7	Copper	53	0.530	95.5	1.02	100	1	100	0.544
X308	ME00L7	Lead	28	0.280	95.5	1.02	100	1	100	0.287
X308	ME00L7	Manganese	12	0.120	95.5	1.02	100	1	100	0.123
X308	ME00L7	Mercury	4.4	0.044	95.5	1.02	100	1	100	0.045
X308	ME00L7	Nickel	28	0.280	95.5	1.02	100	1	100	0.287
X308	ME00L7	Selenium	90	0.900	95.5	1.02	100	1	100	0.924
X308	ME00L7	Silver	32	0.320	95.5	1.02	100	1	100	0.329
X308	ME00L7	Zinc	30	0.300	95.5	1.02	100	1	100	0.308
X308	ME00L7	Cyanide	2	0.020	95.5	1.02	100	1	100	0.021
X309	ME00L8	Arsenic	35	0.350	88.3	1.01	100	1	100	0.392
X309	ME00L8	Barium	15	0.150	88.3	1.01	100	1	100	0.168
X309	ME00L8	Cadmium	15	0.150	88.3	1.01	100	1	100	0.168
X309	ME00L8	Chromium	18	0.180	88.3	1.01	100	1	100	0.202
X309	ME00L8	Copper	53	0.530	88.3	1.01	100	1	100	0.594
X309	ME00L8	Lead	28	0.280	88.3	1.01	100	1	100	0.314
X309	ME00L8	Manganese	12	0.120	88.3	1.01	100	1	100	0.135
X309	ME00L8	Mercury	4.4	0.044	88.3	1.01	100	1	100	0.049
X309	ME00L8	Nickel	28	0.280	88.3	1.01	100	1	100	0.314
X309	ME00L8	Selenium	90	0.900	88.3	1.01	100	1	100	1.009
X309	ME00L8	Silver	32	0.320	88.3	1.01	100	1	100	0.359
X309	ME00L8	Zinc	30	0.300	88.3	1.01	100	1	100	0.336
X309	ME00L8	Cyanide	2	0.020	88.3	1.01	100	1	100	0.022
X310	ME00L9	Arsenic	35	0.350	82.1	1	100	1	100	0.426
X310	ME00L9	Barium	15	0.150	82.1	1	100	1	100	0.183
X310	ME00L9	Cadmium	15	0.150	82.1	1	100	1	100	0.183
X310	ME00L9	Chromium	18	0.180	82.1	1	100	1	100	0.219
X310	ME00L9	Copper	53	0.530	82.1	1	100	1	100	0.646
X310	ME00L9	Lead	28	0.280	82.1	1	100	1	100	0.341
X310	ME00L9	Manganese	12	0.120	82.1	1	100	1	100	0.146
X310	ME00L9	Mercury	4.4	0.044	82.1	1	100	1	100	0.054
X310	ME00L9	Nickel	28	0.280	82.1	1	100	1	100	0.341
X310	ME00L9	Selenium	90	0.900	82.1	1	100	1	100	1.096
X310	ME00L9	Silver	32	0.320	82.1	1	100	1	100	0.390
X310	ME00L9	Zinc	30	0.300	82.1	1	100	1	100	0.365
X310	ME00L9	Cyanide	2	0.020	82.1	1	100	1	100	0.024
X311	ME00M0	Arsenic	35	0.350	85.3	1	100	1	100	0.410
X311	ME00M0	Barium	15	0.150	85.3	1	100	1	100	0.176
X311	ME00M0	Cadmium	15	0.150	85.3	1	100	1	100	0.176
X311	ME00M0	Chromium	18	0.180	85.3	1	100	1	100	0.211
X311	ME00M0	Copper	53	0.530	85.3	1	100	1	100	0.621
X311	ME00M0	Lead	28	0.280	85.3	1	100	1	100	0.328
X311	ME00M0	Manganese	12	0.120	85.3	1	100	1	100	0.141
X311	ME00M0	Mercury	4.4	0.044	85.3	1	100	1	100	0.052
X311	ME00M0	Nickel	28	0.280	85.3	1	100	1	100	0.328
X311	ME00M0	Selenium	90	0.900	85.3	1	100	1	100	1.055
X311	ME00M0	Silver	32	0.320	85.3	1	100	1	100	0.375
X311	ME00M0	Zinc	30	0.300	85.3	1	100	1	100	0.352
X311	ME00M0	Cyanide	2	0.020	85.3	1	100	1	100	0.023

Notes:

MDL - Method Detection Limit

mL - volume of final volume in milliliters after sample preparation

SCL - Sample Quantitation Limit

Wm - Minimum method required wet sample weight

Vm - Method required final sample volume

**Table 2**  
**Sample Quantitation Limit Calculations for Source 2**

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**Notes:**

#### **MDL - Method Detection Limit**

mL = volume of final volume in milliliters after sample preparation

SQL - Sample Quantitation Limit

Wm - Minimum method required wet sample weight

V<sub>m</sub> - Method required final sample volume

**Table 3**  
**Sample Quantitation Limit Calculations for the Source 3**

Sample Location	Sample No.	Compound	MDL (ug/L)	MDL (mg/kg)	Percent Solids	Weight of Sample in grams	Volume in mL	Wm	Vm	SQL
X201	ME00P4	Arsenic	34	0.340	37.3	1	100	1	100	0.912
X201	ME00P4	Barium	11	0.110	37.3	1	100	1	100	0.295
X201	ME00P4	Cadmium	9	0.090	37.3	1	100	1	100	0.241
X201	ME00P4	Chromium	14	0.140	37.3	1	100	1	100	0.375
X201	ME00P4	Cobalt	14	0.140	37.3	1	100	1	100	0.375
X201	ME00P4	Copper	45	0.450	37.3	1	100	1	100	1.206
X201	ME00P4	Lead	17	0.170	37.3	1	100	1	100	0.456
X201	ME00P4	Manganese	7	0.070	37.3	1	100	1	100	0.188
X201	ME00P4	Mercury	4	0.044	37.3	1	100	1	100	0.118
X201	ME00P4	Nickel	12	0.120	37.3	1	100	1	100	0.322
X201	ME00P4	Selenium	30	0.300	37.3	1	100	1	100	0.804
X201	ME00P4	Silver	16	0.160	37.3	1	100	1	100	0.429
X201	ME00P4	Zinc	14	0.140	37.3	1	100	1	100	0.375
X201	ME00P4	Cyanide	2	0.020	37.3	1	100	1	100	0.054
X202	ME00N2	Arsenic	34	0.340	69.5	1.02	100	1	100	0.480
X202	ME00N2	Barium	11	0.110	69.5	1.02	100	1	100	0.155
X202	ME00N2	Cadmium	9	0.090	69.5	1.02	100	1	100	0.127
X202	ME00N2	Chromium	14	0.140	69.5	1.02	100	1	100	0.197
X202	ME00N2	Cobalt	14	0.140	69.5	1.02	100	1	100	0.197
X202	ME00N2	Copper	45	0.450	69.5	1.02	100	1	100	0.635
X202	ME00N2	Lead	17	0.170	69.5	1.02	100	1	100	0.240
X202	ME00N2	Manganese	7	0.070	69.5	1.02	100	1	100	0.099
X202	ME00N2	Mercury	4	0.044	69.5	1.02	100	1	100	0.062
X202	ME00N2	Nickel	12	0.120	69.5	1.02	100	1	100	0.169
X202	ME00N2	Selenium	30	0.300	69.5	1.02	100	1	100	0.423
X202	ME00N2	Silver	16	0.160	69.5	1.02	100	1	100	0.226
X202	ME00N2	Zinc	14	0.140	69.5	1.02	100	1	100	0.197
X202	ME00N2	Cyanide	2	0.020	69.5	1.02	100	1	100	0.028
X203	ME00N0	Arsenic	34	0.340	60.6	1	100	1	100	0.561
X203	ME00N0	Barium	11	0.110	60.6	1	100	1	100	0.182
X203	ME00N0	Cadmium	9	0.090	60.6	1	100	1	100	0.149
X203	ME00N0	Chromium	14	0.140	60.6	1	100	1	100	0.231
X203	ME00N0	Cobalt	14	0.140	60.6	1	100	1	100	0.231
X203	ME00N0	Copper	45	0.450	60.6	1	100	1	100	0.743
X203	ME00N0	Lead	17	0.170	60.6	1	100	1	100	0.281
X203	ME00N0	Manganese	7	0.070	60.6	1	100	1	100	0.116
X203	ME00N0	Mercury	4	0.044	60.6	1	100	1	100	0.073
X203	ME00N0	Nickel	12	0.120	60.6	1	100	1	100	0.198
X203	ME00N0	Selenium	30	0.300	60.6	1	100	1	100	0.495
X203	ME00N0	Silver	16	0.160	60.6	1	100	1	100	0.264
X203	ME00N0	Zinc	14	0.140	60.6	1	100	1	100	0.231
X203	ME00N0	Cyanide	2	0.020	60.6	1	100	1	100	0.033
X204	ME00N1	Arsenic	34	0.340	61.8	1	100	1	100	0.550
X204	ME00N1	Barium	11	0.110	61.8	1	100	1	100	0.178
X204	ME00N1	Cadmium	9	0.090	61.8	1	100	1	100	0.146
X204	ME00N1	Chromium	14	0.140	61.8	1	100	1	100	0.227
X204	ME00N1	Cobalt	14	0.140	61.8	1	100	1	100	0.227
X204	ME00N1	Copper	45	0.450	61.8	1	100	1	100	0.728
X204	ME00N1	Lead	17	0.170	61.8	1	100	1	100	0.275
X204	ME00N1	Manganese	7	0.070	61.8	1	100	1	100	0.113
X204	ME00N1	Mercury	4	0.044	61.8	1	100	1	100	0.071
X204	ME00N1	Nickel	12	0.120	61.8	1	100	1	100	0.194
X204	ME00N1	Selenium	30	0.300	61.8	1	100	1	100	0.485
X204	ME00N1	Silver	16	0.160	61.8	1	100	1	100	0.259
X204	ME00N1	Zinc	14	0.140	61.8	1	100	1	100	0.227
X204	ME00N1	Cyanide	2	0.020	61.8	1	100	1	100	0.032
X205	ME00M8	Arsenic	35	C 350	69.1	1	100	1	100	0.507
X205	ME00M8	Barium	15	C 150	69.1	1	100	1	100	0.217
X205	ME00M8	Cadmium	15	C 150	69.1	1	100	1	100	0.217
X205	ME00M8	Chromium	18	C 180	69.1	1	100	1	100	0.260
X205	ME00M8	Cobalt	16	C 160	69.1	1	100	1	100	0.232
X205	ME00M8	Copper	53	C 530	69.1	1	100	1	100	0.767
X205	ME00M8	Lead	28	C 280	69.1	1	100	1	100	0.405
X205	ME00M8	Manganese	12	C 120	69.1	1	100	1	100	0.174
X205	ME00M8	Mercury	4.4	C 044	69.1	1	100	1	100	0.064
X205	ME00M8	Nickel	28	C 280	69.1	1	100	1	100	0.405
X205	ME00M8	Selenium	90	C 900	69.1	1	100	1	100	1.302
X205	ME00M8	Silver	32	C 320	69.1	1	100	1	100	0.463
X205	ME00M8	Zinc	30	C 300	69.1	1	100	1	100	0.434
X205	ME00M8	Cyanide	2	C 020	69.1	1	100	1	100	0.029

Notes MDL - Method Detection Limit

ml - volume of final volume in milliliters after sample preparation

SQL - Sample Quantitation Limit

Wm - Minimum method required wet sample weight

Vm - Method required final sample volume

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**Table 3**  
**Sample Quantitation Limit Calculations for the Source 3**

Sample Location	Sample No	Compound	MDL (ug/L)	MDL (mg/kg)	Percent Solids	Weight of Sample in grams	Volume in mL	Wm	Vm	SQL
X206	ME00M9	Arsenic	35	0.350	81.1	1	100	1	100	0.432
X206	ME00M9	Barium	15	0.150	81.1	1	100	1	100	0.185
X206	ME00M9	Cadmium	15	0.150	81.1	1	100	1	100	0.185
X206	ME00M9	Chromium	18	0.180	81.1	1	100	1	100	0.222
X206	ME00M9	Cobalt	16	0.160	81.1	1	100	1	100	0.197
X206	ME00M9	Copper	53	0.530	81.1	1	100	1	100	0.654
X206	ME00M9	Lead	28	0.280	81.1	1	100	1	100	0.345
X206	ME00M9	Manganese	12	0.120	81.1	1	100	1	100	0.148
X206	ME00M9	Mercury	4.4	0.044	81.1	1	100	1	100	0.054
X206	ME00M9	Nickel	28	0.280	81.1	1	100	1	100	0.345
X206	ME00M9	Selenium	90	0.900	81.1	1	100	1	100	1.110
X206	ME00M9	Silver	32	0.320	81.1	1	100	1	100	0.395
X206	ME00M9	Zinc	30	0.300	81.1	1	100	1	100	0.370
X206	ME00M9	Cyanide	2	0.020	81.1	1	100	1	100	0.025
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X207	ME00M4	Arsenic	35	0.350	64.2	1.02	100	1	100	0.534
X207	ME00M4	Barium	15	0.150	64.2	1.02	100	1	100	0.229
X207	ME00M4	Cadmium	15	0.150	64.2	1.02	100	1	100	0.229
X207	ME00M4	Chromium	18	0.180	64.2	1.02	100	1	100	0.275
X207	ME00M4	Cobalt	16	0.160	64.2	1.02	100	1	100	0.244
X207	ME00M4	Copper	53	0.530	64.2	1.02	100	1	100	0.809
X207	ME00M4	Lead	28	0.280	64.2	1.02	100	1	100	0.428
X207	ME00M4	Manganese	12	0.120	64.2	1.02	100	1	100	0.183
X207	ME00M4	Mercury	4.4	0.044	64.2	1.02	100	1	100	0.067
X207	ME00M4	Nickel	28	0.280	64.2	1.02	100	1	100	0.428
X207	ME00M4	Selenium	90	0.900	64.2	1.02	100	1	100	1.374
X207	ME00M4	Silver	32	0.320	64.2	1.02	100	1	100	0.489
X207	ME00M4	Zinc	30	0.300	64.2	1.02	100	1	100	0.458
X207	ME00M4	Cyanide	2	0.020	64.2	1.02	100	1	100	0.031
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X208	ME00M5	Arsenic	35	0.350	69.7	1.01	100	1	100	0.497
X208	ME00M5	Barium	15	0.150	69.7	1.01	100	1	100	0.213
X208	ME00M5	Cadmium	15	0.150	69.7	1.01	100	1	100	0.213
X208	ME00M5	Chromium	18	0.180	69.7	1.01	100	1	100	0.256
X208	ME00M5	Cobalt	16	0.160	69.7	1.01	100	1	100	0.227
X208	ME00M5	Copper	53	0.530	69.7	1.01	100	1	100	0.753
X208	ME00M5	Lead	28	0.280	69.7	1.01	100	1	100	0.398
X208	ME00M5	Manganese	12	0.120	69.7	1.01	100	1	100	0.170
X208	ME00M5	Mercury	4.4	0.044	69.7	1.01	100	1	100	0.063
X208	ME00M5	Nickel	28	0.280	69.7	1.01	100	1	100	0.398
X208	ME00M5	Selenium	90	0.900	69.7	1.01	100	1	100	1.278
X208	ME00M5	Silver	32	0.320	69.7	1.01	100	1	100	0.455
X208	ME00M5	Zinc	30	0.300	69.7	1.01	100	1	100	0.426
X208	ME00M5	Cyanide	2	0.020	69.7	1.01	100	1	100	0.028
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X209	ME00M6	Arsenic	35	0.350	67.5	1	100	1	100	0.519
X209	ME00M6	Barium	15	0.150	67.5	1	100	1	100	0.222
X209	ME00M6	Cadmium	15	0.150	67.5	1	100	1	100	0.222
X209	ME00M6	Chromium	18	0.180	67.5	1	100	1	100	0.267
X209	ME00M6	Cobalt	16	0.160	67.5	1	100	1	100	0.237
X209	ME00M6	Copper	53	0.530	67.5	1	100	1	100	0.785
X209	ME00M6	Lead	28	0.280	67.5	1	100	1	100	0.415
X209	ME00M6	Manganese	12	0.120	67.5	1	100	1	100	0.178
X209	ME00M6	Mercury	4.4	0.044	67.5	1	100	1	100	0.065
X209	ME00M6	Nickel	28	0.280	67.5	1	100	1	100	0.415
X209	ME00M6	Selenium	90	0.900	67.5	1	100	1	100	1.333
X209	ME00M6	Silver	32	0.320	67.5	1	100	1	100	0.474
X209	ME00M6	Zinc	30	0.300	67.5	1	100	1	100	0.444
X209	ME00M6	Cyanide	2	0.020	67.5	1	100	1	100	0.030

Notes: MDL - Method Detection Limit  
 mL - volume of final volume in milliliters after sample preparation  
 SQL - Sample Quantitation Limit  
 Wm - Minimum method required wet sample weight  
 Vm - Method required final sample volume

**Table 3**  
**Sample Quantitation Limit Calculations for the Source 3**

Sample Location	Sample No.	Compound	MDL (ug/L)	MDL (mg/kg)	Percent Solids	Weight of Sample in grams	Volume in mL	Wm	Vm	SQL
X210	ME00M3	Arsenic	35	0.350	53.2	1.02	100	1	100	0.645
X210	ME00M3	Barium	15	0.150	53.2	1.02	100	1	100	0.276
X210	ME00M3	Cadmium	15	0.150	53.2	1.02	100	1	100	0.276
X210	ME00M3	Chromium	18	0.180	53.2	1.02	100	1	100	0.332
X210	ME00M3	Cobalt	16	0.160	53.2	1.02	100	1	100	0.295
X210	ME00M3	Copper	53	0.530	53.2	1.02	100	1	100	0.977
X210	ME00M3	Lead	28	0.280	53.2	1.02	100	1	100	0.516
X210	ME00M3	Manganese	12	0.120	53.2	1.02	100	1	100	0.221
X210	ME00M3	Mercury	4.4	0.044	53.2	1.02	100	1	100	0.081
X210	ME00M3	Nickel	28	0.280	53.2	1.02	100	1	100	0.516
X210	ME00M3	Selenium	90	0.900	53.2	1.02	100	1	100	1.659
X210	ME00M3	Silver	32	0.320	53.2	1.02	100	1	100	0.590
X210	ME00M3	Zinc	30	0.300	53.2	1.02	100	1	100	0.553
X210	ME00M3	Cyanide	2	0.020	53.2	1.02	100	1	100	0.037

Notes: MDL - Method Detection Limit

mL - volume of final volume in milliliters after sample preparation

SQL - Sample Quantitation Limit

Wm - Minimum method required wet sample weight

Vm - Method required final sample volume